BIOSAFETY EQUIPMENT

UV cabinet

Medical–Biological
Research & Technologies

UVC/T-AR

DNA/RNA UV-cleaner box

Operating Manual
Certificate

for versions:
V.3AD

Contents

1. Safety Precautions
2. General Information
3. Getting Started
4. Operation
5. Specifications
6. Maintenance
7. Warranty and Claims
8. Declaration of Conformity

1. Safety Precautions

The following symbols mean:

Caution! Make sure you have fully read and understood the present Manual before using the equipment. Please pay special attention to sections marked by this symbol.

Caution! Do not work in the cabinet or open the front protective screen while the open UV lamp is switched ON. Otherwise it can expose the operator to a dangerous level of UV emission.

Caution! Exposure to UV light is harmful and can cause damage to unprotected eyes and skin. The UV-cleaner box contains a powerful source of UV radiation, therefore, before operating the unit, ensure all personnel working with the UV-cleaner box are properly protected.

The operator should wear a closed-front lab coat (fully buttoned), UV certified safety glasses and gloves, which should overlap the lab coat or surgical gown cuffs.

GENERAL SAFETY

- Use only as specified in the Operating Manual provided.
- The unit should not be used if dropped or damaged.
- After transportation or storage keep the unit under room temperature for 2—3 hrs before connecting it to the electric circuit.
- Use only cleaning and decontamination methods recommended by the manufacturer.
- Do not make modifications to the design of the unit.

ELECTRICAL SAFETY

- Connect only to electric circuit with voltage corresponding to that on the serial number label.
- Ensure that the switches and plug are easily accessible during use.
- Do not plug the unit into an ungrounded power socket, and do not use an ungrounded extension lead.
- Disconnect the unit from the electric circuit before moving.
- If liquid penetrates into the unit, disconnect it from the electric circuit and have it checked by a repair and maintenance technician.
- Do not operate the unit in premises where condensation can form. Operating conditions of the unit are defined in the Specifications section.

DURING OPERATION

- Do not operate the unit in environments with aggressive or explosive chemical mixtures. Please contact manufacturer for possible operation of the unit in specific atmospheres.
- Do not operate the unit without dust filters installed.
- Do not operate the unit if it is faulty or has been installed incorrectly.
- Do not use outside laboratory rooms.
- Do not work in the box while the open UV lamp is switched ON.

BIOLOGICAL SAFETY

- It is the user's responsibility to carry out appropriate decontamination if hazardous material is spilt on or penetrates into the equipment.

2. General Information

Bench top model of DNA/RNA UV-cleaner box UVC/T-AR is specially designed for laboratories of molecular biology, DNA analysis and genetic engineering.

The front panel of UV-cleaner box with a folding protective screen, side and rear walls are made of durable plexiglas. The working surface is of stainless steel. The framework and the top are of steel with chemical resistant powder coating. At the rear wall there is an inlet for power cords.

At the top of the working area of UV-cleaner box there are:

1. Fluorescent lamp (15 W) for working area illumination
2. Open UV lamp (25 W) for working area disinfection
3. UV Recirculator (25 W) for amplicon inactivation inside the UV-cleaner box

A digital timer controls duration of working surface irradiation with UV light in the range from 0 to 24 hours. In case of opening the protective front screen during UV irradiation open UV lamp is switched off automatically.

UV recirculator consists of a UV lamp, a fan and dust filters organized in a plastic case. Operator working in a UV-cleaner box UVC/T-AR with a switched on UV recirculator is not exposed to UV radiation. It allows continuous treatment of the airflow with UV light without interrupting working process. Air circulation at a short distance from the UV lamp combined with reflective surfaces in the air duct results in increased density of UV rays leading to higher efficiency of disinfection. UV recirculator generates 100 volumes of PCR cabinet per one hour of airflow exchange ensuring maximally aseptic conditions inside the cabinet. Cabinet UV lamps do not produce ozone.

DNA/RNA UV-cleaner box with the built-in recirculator is a patented solution (Patent number LV13115 of 20.05.2004, Dr. biol. V. Bankovsky).

Microbiological studies at the R&D Department of Biosan led by Dr. biol. V. Bankovsky demonstrated a high level of biosafety and efficacy of UV-cleaner box UVC/T-AR (maximal level of contamination is 1-3 cfu per 100 liters of air)*.

UV-cleaner box is designed to protect the product, but not the operator, therefore, it is not recommended to use the UV-cleaner box for working with pathogenic microorganisms.

* http://biosan.lv/efficiency_eng

Advantages:

- No HEPA filters;
- UV-recirculator;
- Ozone free high density UV decontamination;
- Open UV lamp is switched off automatically in case of opening the protective front screen;
- Long life UV lamps (9000 h);
- Low noise level;
- Low energy consumption;
- Compact “bench top” model for personal labs;
- Optional table with drawer T-4 (on request).

3. Getting started

3.1. Unpacking.

Remove packing materials carefully and retain them for future shipment or storage of the unit.

Examine the unit carefully for any damage incurred during transit. The warranty does not cover in-transit damage.

Caution! Due to the unit's weight its unpacking and installing is to be carried out by two persons.

3.2. Complete set. Package contents:

Standard set

- UVC/T-AR DNA/RNA UV-cleaner box ..... 1 pce
- spare dust filters ..... 4 pcs
- spare fuse (inside the fuse holder) ..... 1 pce
- power cord ..... 1 pce
- Operating manual, Certificate ..... 1 copy

Optional accessories

- T-4 moving table for UV-cleaner box ..... on request

3.3. Set up:

- if the T-4 table is used, unpack it carefully and assemble according to the enclosed assembling scheme;
- place the unit upon stable surface. Ensure that the unit is placed on a solid, level surface (not less than 720x550 mm), which is able to support its weight and the weight of equipment and materials inside, for instance on the T-4 table;
- plug the power cable into the socket on the rear and position the unit so that there is easy access to the power switches and the power plug.

4. Operation

4.1. Connect the power plug to a grounded power socket.

4.2. UV exposition of the working place.

Caution! Do not work in the cabinet or open the front protective screen while the open UV lamp is switched ON. Otherwise it can expose the operator to a dangerous level of UV emission.

4.2.1. Turn ON switch **2** (Fig.1/2). This automatically turns on the UV recirculator with the hidden UV lamp and activates the timer of open UV lamp. The UV recirculator will operate all the time until switch **2** is turned OFF.

Note! Open UV lamp operation can be checked with the visible light lamp switched off (switch 1 is OFF). Use the indicator in the center of recirculator cover to check operation of UV lamp inside the recirculator. If indicator is lights from inside while switch 2 is ON, then the UV lamp is functioning.

4.2.2. Use the timer **+** and **-** keys (Fig.1/4) to set the time (UV-LIGHT TIME CONTROLLER) of direct UV light exposition of the working place:

(+) to increase exposition time (the increment is 1 min);

(-) to decrease exposition time (the increment is 1 min).

Pressing down and holding the button for more than 2 sec will increase the increment.

Recommended time of exposition is 15—min.

4.2.3. Press the **Start** key (Fig.1/3), the UV lamp will be turned on automatically and the timer will start counting up the exposition time. Timer indicator shows actual time: till 1 hour — in minutes and seconds (mm:ss), after 1 hour —in hours and minutes (hh:mm).

After reaching the set time the timer will automatically turn off the open UV lamp.

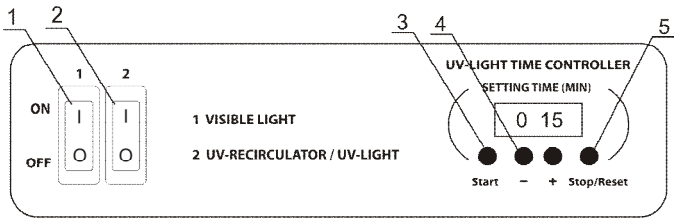

Fig.1. Control Panel

4.2.4. The open UV lamp can be switched off by pressing the **Stop/Reset** key (Fig.1/5). The set time of exposition will be saved in the memory. The set time won't be saved after the complete switching off the unit.

4.2.5. If the set time of open UV light exposition is 0:00, pressing the **Start** key will make the unit operate continuously during 24 hrs or until the **Stop/Reset** key is pressed.

UV cleaner cabinet is ready for use.

4.3. Work in the Box.

Note: Opening the front protective screen will automatically switch off the open UV lamp, but the timer will continue counting up the exposition time.

4.3.1. Turn ON switch **1** (Fig.1/1) for lighting of the working place (this turns ON the Luminescent (Visible light) lamp).

4.3.2. Open the front protective screen up for work in the cabinet.

4.3.3. After the task is done close the front protective screen.

4.3.4. After finishing the operation turn OFF switch **2** and switch **1**.

4.4. Disconnect the power cord from electric circuit.

5. Specifications

The unit is designed for operation in cold rooms, incubators and closed laboratory rooms at ambient temperature from +4°C to +40°C in a non-condensing atmosphere and maximum relative humidity 80% for temperatures up to 31°C decreasing linearly to 50% relative humidity at 40°C.

- Open UV lamp ..... TUV 25 W G13 UV-C
- Radiation type ..... UV (254 nm), ozone free
- UV lamp life time ..... 9000 hrs
- UV recirculator ..... TUV 25 W G13 UV-C
- Digital time setting of direct UV exposure ..... 1 min —24 h
- Visible light lamp 15 W/830 G13
- Plexiglass type ..... Polymethylmethacrylate
- Optical transmission 92%
- UV protection 99.9%
- Protection film type ..... 4 MIL CLEAR
- Thickness of sides panels ..... 4 mm
- Thickness of upper front panel ..... 8 mm
- Thickness of front protective screen ..... 8 mm
- Working place ..... 650x475 mm
- Overall size ..... 690x535x555 mm
- Operating voltage / power consumption ..... 100-240 V, 50/60 Hz, 67 W
- Weight* ..... 23 kg

Optional accessories	Description	Catalogue number
T-4	moving table with a drawer and wheel locks, dimensions 800x600x745 mm	BS-040101-BK

Biosan is committed to a continuous programme of improvement and reserves the right to alter design and specifications of the equipment without additional notice.

* Accurate within ±10%

6. Maintenance

6.1. If the unit requires maintenance, disconnect the unit from the electric circuit and contact Biosan or your local Biosan representative.

6.2. All maintenance and repair operations must be performed only by qualified and specially trained personnel.

6.3. **Fuse replacement**

Disconnect the unit from the electric circuit and remove the power plug from the rear of the unit. Pull out the fuse holder by applying leverage in recess (Fig.2/A). Remove the fuse from the holder. Check and replace with the correct fuse if necessary (3,15 A for 100— V, 50/60 Hz).

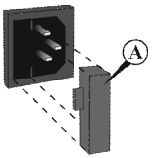

Fig. 2 Fuse replacement

6.4. **UV lamp replacement**

Average life time of UV lamps supplied is 9000 hrs. Replacement is necessary after lamp stops functioning or at the end of manufacturer specified life time.

It is allowed to perform lamps replacement only to the persons who have completed special training.

Open UV lamp operation can be checked with the visible light off (switch **1** is OFF). Use the indicator in the center of recirculator cover to check operation of UV lamp inside the recirculator. If indicator is lights from inside while switch **2** is ON, then the UV lamp is functioning.

6.5. **Care and Cleaning**

The front panel, front protective panel and side panels are made of plexiglass and are prone to scratches and optical transmission capacity decrease if improperly cleaned. Care during cleaning and use of the equipment is recommended to reduce wear of the coating on the plexiglass.

Cleaning the unit:

- unplug the unit from electric circuit before cleaning.
- use mild soap and water with a soft cloth or sponge for cleaning the unit exterior.
- use a mild detergent for all the interior surfaces.
- wipe excess water from inside and outside the unit with an absorbent soft cloth or sponge.

Caution! Do not allow moisture to enter the control box.

Caution! Clean the front protective screen and side panels with a mild detergent; never use organic based compounds, pure alcohol, alcohol-containing cleaners (more than 15%) or Ammonia containing cleaners for plexiglass! Do not use abrasive pads or cleansers.

6.6. For decontamination, it is recommended to use a special DNA/RNA removing solution (e.g. DNA-Exitus PlusTM, RNase-Exitus PlusTM). After washing the inside parts of the box it is necessary to rub them dry.

The table below shows the interreaction of plexiglass with ethyl alcohol and other solutions.

Liquid	Interreaction with plexiglass
DNA-Exitus PlusTM	No reaction.
RNase-Exitus PlusTM	No reaction.
Ethyl alcohol 10-15 %	No reaction.
Ethyl alcohol 30 %	Limited reaction.
Ethyl alcohol Pure	Full reaction. Do not use!
H2O2 6%	No reaction.

Note! Crazing is a normal process for plexiglass panels exposed to open UV light. Crazing will occur over a period of time. Reduce crazing by keeping exposure to open UV to a minimum. Crazing may occur within the warranty period and is regarded as normal wear and not covered by the warranty. Plexiglass panels can be replaced. Refer to Replacement Parts for ordering information.

6.7. **Dust filter replacement**

The dust filters on either end of the UV recirculator with the hidden UV lamp should be checked monthly and cleaned or replaced when they become clogged. To check, replace or clean the filters, simply unclip the covers, if it is necessary fit a new or rinse in water, dry and set up existing filters. Clip covers back in place.

7. Warranty and Claims

7.1. The Manufacturer guarantees the compliance of unit with the requirements of Specifications, provided the Customer follows the operation, storage and transportation requirements.

7.2. The warranted service life of unit from date of delivery to the Customer is 24 months (exclude lamps and dust filters). Contact your local distributor to check availability of extended warranty.

7.3. If any manufacturing defects are discovered by the Customer, an unsatisfactory equipment claim shall be compiled, certified and sent to the local distributor address. Please visit www.biosan.lv, Technical support section to obtain the claim form.

7.4. The following information will be required in the event that warranty or post-warranty service comes necessary. Complete the table below and retain for your records.

Model	UVC/T-AR DNA/RNA UV-cleaner box
Serial number	
Date of sale	

8. Declaration of Conformity

Declaration of Conformity

Equipment name:	**UVC/T-AR**
Type of equipment:	DNA/RNA UV-cleaner box
Directive:	EMC Directive 2004/108/EC Low Voltage Directive 2006/95/EC RoHS 2011/65/EC WEEE 2002/96/EC & 2012/19/EU
Manufacturer:	SIA BIOSAN Ratsupites 7, build.2, Riga, LV-1067, Latvia
Applied Standards:	**EN 61326-1:** Electrical equipment for measurement, control and laboratory use EMC requirements. General requirements **EN 61010-1:** Safety requirements for electrical equipment for measurement, control and laboratory use. General requirements

We declare that this product conforms to the requirements of the above Directive(s)

Signature

Svetlana Bankovska
Managing director

26.02.2014
Date

Signature

Aleksandr Shevchik
Engineer of R&D

20.02.2014
Date

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